Ohio Last Copy Repository Feasibility Study

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Summary

The Ohio State University Libraries are evaluating a project to create a center that will **1)** house last copies of print materials in Ohio research libraries at **2)** a centralized fulfillment center serving the entire state through rapid print and digital delivery and **3)** enable this mega-collection to give Ohio libraries an advantageous position in the emerging national "collective collections" efforts. This position would advance initiatives that could include large scale digitization, expedited interlibrary lending among research collections nationwide, and cooperative commitments to ensure the preservation of the national collection at sustainable costs.

A key assumption is that OSU partners will contribute only their uniquely held materials, and then make local collection development decisions against the backdrop of this statewide research collection. This provides several critical assurances to each partner's library users: **the collection will be kept safe, at lower overall cost, with faster and easier access.** This is possible because:

1. A copy of every title will be kept in a purpose built preservation repository, backed by a retention commitment and OSU's preservation, conservation and technical services capabilities.
2. The costs of preserving and providing access will be lower and more predictable, and the partners will benefit from improved economies of scale, compared to the current depository system which requires multiple management operations to serve a smaller sets of materials.
3. A centralized, higher-volume fulfillment center decreases overall delivery time to all parts of Ohio and allows for future service enhancements, at scale, to the entire collection.

Overall, the project requires 18-24 months from the funding and inception of the capital project to the initial intake of materials to allow for construction of an additional module at the OSU depository and establish the staff and fulfilment services. **All partner libraries would then transfer materials to the center over the course of the following 24-36 months,** so that the project is complete in approximately five years from the start date. The total startup costs for the project are estimated at $15,410,000 in the first 36 months, to construct the center and initiate service. Of this total, OSU must be prepared to supply $6-7 million, supplemented by approximately $7-8million from partner libraries. After the center is at capacity, all partners, including OSU, will be expected to contribute a shared of the estimated $450,000 in total operating costs, apportioned based on the total scope of each library's usage of the collection.

Partner libraries must be prepared to make financial contributions and should be willing to transfer ownership of materials to OSU. The total financial outlay required of partners will be lower than the current costs of their offsite collection operations and there is some flexibility in the timelines for making financial contributions. A transfer of ownership is desirable to facilitate a variety of activities once materials are collocated at OSU; however, several potential partners expressed a desire to house and maintain ownership of certain classes of distinctive materials. **This project assumes that partners will only make contributions that will be available for circulation amongst the partners**.

In the course of this project, OSU will be required to make a major capital investment in an expansion to its depository, to take on the project management activities associated with that capital project, and to provide fulfillment services necessary to ensure that partners receive the agreed-upon service levels from the centralized collections. OSU has all of the key service elements in place and functioning well in its current operations to do this, so this aspect of the project, while non-trivial, does not require development of new services or acquisition of staff with new skillsets.

Background and Next Steps

During the past year, several Ohio research libraries approached OSU about the possibilities of a cooperative print management effort. This was predicated on the expansion of the OSU depository to hold a copy of record accessible to the participating libraries, and was motivated by two primary risks and a pair of linked opportunities.

The libraries generally agreed that there was a substantial risk that the state support for the existing depository infrastructure was likely to sunset over the next 5-7 years and this risk was exacerbated by the fact that all depositories were at or near full capacity. Consequently, all parties would have to spend on added collections storage services in the near future, through some combination of capital outlays for new storage facilities, newly assumed cost for operating the existing depositories, and increased operating costs for additional storage services.

These challenges arise at a time when the national research library landscape is increasingly shifting to cooperative arrangements for shared stewardship of the research collection above the level of any single campus. Large-scale fulfillment services and digitization (in colloquial terms, Amazon Prime and Google Books, but in library-specific examples, OhioLINK or Borrow Direct and HathiTrust or JSTOR) combined with the usage patterns of long-tail research materials can create a system that allows each institution to make substantially deeper collections available to its faculty with service levels that meet or exceed what most libraries can offer on their own.

In early 2017, OSU requested a study to evaluate a variety of factors that would bear on the possible success of this approach and to consider the following points:

- General capital and operational costs associated with various types of facilities

- Business models that consider both the outright costs for OSU current services and partner needs, as well as potential sources of external support or revenue
- The overall value proposition for OSU and for potential partners
- The size of the facility needed to address both OSU collections and significant last copy collections currently held elsewhere in the state, and the costs of such a facility
- Economies of scale that can guide OSU in determining the most efficient type of facility and operations
- Willingness to pay and preference for payment schedules among key Ohio partner libraries, and for OSU as a recipient of funding
- Key points of agreement around collections ownership and the service levels required for a successful partnership
- Timelines for the elements of work in the various options, highlighting key dependencies and obstacles; general costs and business models for the options; and a succinct value proposition statement and/or set of talking points for use with senior management.

This feasibility study has concluded that there is a viable path forward to creating a facility that will ensure Ohio's scholarly community has dependable access to a wider scope of materials, with print and digital fulfillment services that are an improvement over the current statewide resource sharing model, and with a lower system wide cost than is possible with multiple smaller depositories.

If OSU and a set of partners decide to pursue this direction, there are a number of financial requirements outlined in this report along with an architectural design process, which OSU is prepared to manage. The partners will need to discuss collection management issues pertaining to the staging of intake into the facility and selection criteria for "last copy," settle ownership issues, and agree to a final services agreement and billing structure. I would recommend a second external consultant review this feasibility study to revisit the assumptions and verify the conclusions that follow from the, and then create a timeline linking the collections planning to the capital project.

Finally, this document essentially describes the relevant costs and value proposition for library storage and fulfillment services. So, although this study assumes OSU as the managing partner, this study could also serve as due diligence for an RFP for a third-party service provider.

Financial Data

Capital Costs

The partners should plan for a total capital outlay of approximately $14.5 million or $3.63 per volume-equivalent, to construct a facility housing approximately 4 million items. A somewhat smaller project, estimated at $11.4 million for 3.1 million volumes, or $3.68 volume-equivalent, was previously scoped architecturally and is also analyzed here.

OSU has developed a strong case for a facility able to accommodate 4 million items, to account for the

needs of potential partners and OSU's own collection management goals. The cost estimates for this facility are based on a study completed by SHP Leading Design on March 17, 2015. That study estimated the expansion of the OSU Depository would provide space for between 3-3.2 million items (depending on the racking types and configuration) and cost $11,116,956, for a cost of approximately$3.59 per volume-equivalent of storage.

The larger, 4-million item facility proposed in this feasibility study may net some per-volume savings over the smaller facility. Although most of the project will simply grow in proportion to the increased size -- foundation, floor slab, shelving, shell, and roofing -- some systems will not need to be expanded in direct proportion in order to adequately service the larger shelving area. In particular, the larger facility should be able to operate without a significantly larger HVAC plant. These mechanical systems account for about 10% of the costs of the planned facility. This feasibility study increases all major costs except HVAC by 30%, to account for the increased size of the project throughout the other major areas plus an additional 1% for unforeseen added costs, and then adds in the original HVAC costs to arrive at a base cost for the larger facility that is comparable to the SHP study (in 2015 dollars). That cost is escalated by 3% per year to arrive at a cost of $14,540,141 or $3.64 per volume equivalent for this feasibility study.

Each partner will be called upon to contribute a portion of the capital costs. This study assumes that the principal cost benefit to partners is achieved by relieving space pressures at their current campus libraries or local storage facilities, so costs are scaled in proportion to the amount of material transferred from existing facilities to the new facility. It does not take into account benefits from deduplication against the central collection. Partners can expect that their shares will be in the range of $1-2 million. **For every 100,000 items transferred to the facility, a partner library would need to make a capital outlay of $364,000 to create the capacity to store those materials.**

Estimating Item Counts and Associated Costs

Estimates of item counts were made based on the following counts of unique titles from potential large partners in the state, using data from OCLC's Collection Manager tool, with serials calculated at 10 items per title.

	Monographs	**Serial Volumes**	**Music Scores**
Case	241,068	80,400	9,878
Cincinnati	528,471	167,000	57,796
Kent	329,399	87,000Karl	16,474
Miami	459,433	112,300	
Ohio	371,263	213,300	15,582

If contributions are based on the number of unique items each partner contributes to the collection and all items listed above were transferred, at $3.64 per volume-equivalent, the cost allocations would be:

	Full Transfer (Mono, Scores, Serials*)	Cost @ $3.64 ea	% of 3 MM	% of 4 MM
Case	321,488	$ 1,170,216	10%	8%
Cincinnati	695,521	$ 2,531,696	17%	17%
Kent	416,429	$ 1,515,802	12%	10%
Miami	571,743	$ 2,081,145	19%	14%
Ohio	584,553	$ 2,127,773	23%	15%
OSU (3.1 MM)	510,266*	$ 1,857,368	27%	
OSU (4 MM)	1,410,266	$ 5,133,368		35%

* *Insufficient for OSU's current needs*

Assuming that partners will not transfer all of their uniquely held monographs and serials, and leaving music scores out of the calculation, cost ranges would be:

	90% of Monos; 95% of Serials	Cost @ $3.64 ea	80% of Monos; 90% of Serials	Cost @ $3.64 ea
Case	293,360	$ 1,067,830	265,232	$ 965,444
Cincinnati	634,321	$ 2,308,928	573,122	$ 2,086,164
Kent	379,138	$ 1,380,062	341,846	$ 1,244,319
Miami	520,184	$ 1,893,470	468,625	$ 1,705,795
Ohio	536,762	$ 1,953,814	488,971	$ 1,779,854
OSU (3.1 MM)	736,234	$ 2,679,892	962,203	$ 3,502,419
OSU (4 MM)	1,636,234	$ 5,955,892	1,862,203	$ 6,778,419

For the remainder of this report, the 4 MM item scenario, with 80% of monographs and 90% of serials transferred, will be used.

Operating Costs

The expanded depository will require a significantly larger staff to manage intake of materials on a term basis, and a somewhat larger permanent staff to accommodate the increased volume of services to a larger number of libraries. In addition, the expanded physical plant will require a higher level of spending on utilities and maintenance.

Staffing

Total annual operating costs (labor and POM) are estimated to be $900-1,000,000 during the peak activity period when materials are loaded in, declining to approximately $450,000 after load-in, assuming a 2.4% circulation rate (see "Key Assumptions," below). That indicates that an ongoing average cost of $75,000 per partner, but assuming that those costs scale based on the size of the partner's

faculty and research activity, the R1 schools could expect to pay closer to $100,000 and the others closer to $50,000. These cost projections are several times lower than the current state subsidies for the depositories, which totaled over $1.05 million and ranged from $174-420,000 for each depository.

Facility operating costs

The OSU depository cost model is constrained by the campus service and maintenance assessment rate (POM), which is assessed on a square foot basis. For the purposes of this report, the prevailing POM rates are simply scaled up to the larger facility. On top of this estimate, some percentage of the total capital outlay should be collected and held in reserve to ensure that major maintenance needs can be addressed with a call for special funds from OSU or the partnership. This study incorporates a fund equal to three times the annual POM rate, accumulated at 10% per year over the first 10 years. This adds $41,810 per year to the overall operating costs.

Cost Avoidance

Each partner stands to benefit from some significant cost avoidances in this model. Exact estimates of this are beyond the scope of this study, but some general areas and estimates based on prevailing costs in libraries are included here.

- *Reduced ILL and circulation service costs:* the depository will fulfill ILL requests and management of off-site circulation services will decrease over time. Assuming an average per-transaction cost of $5.40 for labor and materials, this could be a per-partner savings of $40-50,000 per year.
- *Reduced off-site storage costs:* all potential partners included in the analysis are using some combination of the statewide depositories and their own contract storage services to manage their collections. This project provides an opportunity to reduce or eliminate these costs. Depository operations are currently subsidized by state funds, and their total value per partner is several hundreds of thousands of dollars, but the level of state funding is expected to decrease or cease altogether over the next 5-7 years.
- *Re-purposing local spaces:* collections storage occupies a significant amount of campus real-estate, which has a significant value. There is widespread need for new and expanded library service and instructional space on campus, and relocating research materials is a critical step to realizing these needs.
- *Enabling future collection-building:* a cooperative model for collecting research materials may let the partners collect more broadly and deeply together than any one library could on its own.
- *Improved services:* there are a range of fulfilment services that are in reach of current technologies, but cost prohibitive to adapt and deploy with the collections of any one of the partner libraries: expedited digital services, point-to-point physical delivery, or multi-stage delivery options, such as scheduled in advance, digital preview (e.g. contents, introduction, or index) followed by print, or print then digitization to suit particular needs. Centralizing the investment in collections may lower the cost barriers to providing radical service improvements.

Several of these items also provide leverage for funding external to the library budget: new service models, repurposing spaces, and cooperative collection development are activities that align with campus-wide priorities and the funding programs of several major grant making bodies.

Project Plan

Initial Capital Outlay

OSU can utilize cash reserves to cover design and initiate construction once firm commitments are made by the partners. Within 6 months of the project start, the additional one-time contributions from the partners must be in hand at OSU. It may be possible for OSU to obtain campus debt funding for the project to allow some or all partners to pay their capital shares incrementally over a multi-year period.

The simplest method of determining capital contributions is to simply divide total project costs by the number of participants, but this creates costs that are substantially disproportionate to the amount of actual material each partner might transfer. Scaling the capital outlay based on number of unique items contributed to the collection, at $3.46 per volume-equivalent and rounded to the nearest thousand dollars, yields the following allocations:

	Item Count	*** $3.64**	**% Total Capital**
Case	265,232	$ 965,444	7%
Cincinnati	573,122	$ 2,086,164	14%
Kent	341,846	$ 1,244,319	9%
Miami	468,625	$ 1,705,795	12%
Ohio	488,971	$ 1,779,854	12%
OSU	1,862,203	$ 6,778,419	37%
TOTAL	4,000,000	$ 14,560,000	
Per 100k items	*100,000*	*$364,000*	*2.5%*

Among potential partners, some institutions that would prefer to make a large one-time payment to fund construction, followed by a lower ongoing service cost, and other prefer a larger ongoing cost but no large initial capital outlay. This requires OSU to fund initial build and recoup costs throughout the early phases of the project. This may involve a mix of cash and debt service, so estimated costs are based on accounting for inflation only at 2% per year, or debt service at prime rate, 4.25% as of the date of this report, or prime plus 1%, 5.25%. **Subsidized partner should expect to pay an added cost per year (rounded up to the nearest $100) for each 100,000 volume-equivalents of space, estimated between $124,600 and $167,900.**

Total cost of subsidy, from OSU to partner, per 100,000 volume equivalents.

	3 years, annualized	**5 years, annualized**	**7 years, annualized**
At 2% (Inflation)	$373,600	$388,700	$404,400
At 4.25% Interest	$398,900	$433,500	$471,000
At 5.25% Interest	$410,400	$454,700	$503,700

Difference between all cash and subsidy per 100,000 vol-equiv.

For 100,000 vol-equiv	**3 years, annualized**	**5 years, annualized**	**7 years, annualized**
At 2% (Inflation)	$21,600	$36,700	$52,400
At 4.25% Interest	$46,900	$81,500	$119,000
At 5.25% Interest	$58,400	$102,700	$151,700

Annual total cost to the subsidized partner, per 100,000 vol-equiv.

For 100,000 vol-equiv	**3 years, annualized**	**5 years, annualized**	**7 years, annualized**
At 2% (Inflation)	$124,600	$77,800	$57,800
At 4.25% Interest	$133,000	$86,700	$67,300
At 5.25% Interest	$137,000	$91,000	$72,000

Operating Costs

Operations will commence roughly 18 months after the capital project. There is a strong need for intake to be complete within five years from the date of this report, which calls for the major Intake project to last for 24-36 months, and ingest approximately 1 million volumes per year. This will require staff hiring to start 12-15 months after construction, so partners should expect to make their initial operating contributions late in year two of the overall project.

I recommend that the partners split intake costs and POM costs evenly as long as there is an ownership transfer, rather than billing partners per item transferred in. All partners benefit from these transfers into the collective collection and this method simplifies bookkeeping and helps to constrain program management expenses. In later years, there may be some need to bill partners for private intake, but I recommend that the partners agree to only transfer shared materials in the first 2-3 years. From the start, partners should be billed for their usage of the collection.

This allocation of costs ensures that the differences in the year-to-year costs to the partners are tied to usage of the collection, a direct benefit. Making an equal contribution to the overall maintenance of the materials creates a predictable base bill tied to the costs OSU will be required to pay to operate the facility, but also tied to the least expensive per-item service the depository offers. The remainder of each partner's bill is then driven by the actual use-value they derive from the collection.

I recommend the partners adopt a process of projecting use during budget construction, then reconciling actual use and projected use at the close of each fiscal year, and crediting or debiting any differences into the following year's billing. This helps to flatten the billing year-to-year and, especially if partners estimate usage on the high side in the early years, allows the partnership to create a cash reserve through normal business rather than through a special call for funds.

Year to year billing structure

Year one billing

1) Maintenance share = *$A*
2) Vols added this year: ##,###/ # of partners = $*B*
3) Projected use this year: #,### * $ per use = $*C*
4) Capex reimbursement (if applicable) = $*D*

TOTAL: $*A+B+C(+$D)*

Year two, three, etc.

1) Maintenance share = $*A*
2) Vols added this year: #,###/ # of partners = $B
3) Usage
    a. Projected use this year: #,### * $ per use
    b. +/- over/under prior year: ### * $ per use = $*C*
4) Capex reimbursement (if applicable) = $*D*

TOTAL: $*A+B+C(+$D)*

Key Assumptions

Capital Costs

The expansion of the OSU Depository to support between 3.0 - 3.3 million items was estimated to cost $11,116,956 in a March 15, 2015 study conducted by SHP Leading Design, for a cost of $3.58 per volume-equivalent of storage. The SHP study included a section of racking dedicated to AV storage and partitioned from the main storage area, racked for book trays. If the entire area were scoped for book trays, the total capacity would be some 100-200,000 items higher. This study assumes some set-aside space for OSU to use for AV collections, and estimates capacity from the SHP plan conservatively at 3.1 million items.

Although a review will be required before project initiation, differences between SHP's preliminary and the project actual costs are likely to be relatively few and relatively small. For this study, the initial costs have been adjusted upwards by 3% per year to account for escalation and rounded upwards to the nearest $1,000 to provide a basis for planning. This would result in a total capital outlay of $11,410,000 for 3.1 million volumes, or $3.68 volume, based on SHP's original plan.

That 3.1 million item capacity is sufficient for 2.1 million unique items held by the partners, plus an additional 1 million items for OSU collections. OSU has also indicated a possible need for an additional 1 million items (2 million total), which would require an additional capital outlay of approximately $3.1

million by OSU. The cost of the larger, 4-million item facility proposed in this feasibility is estimated at $14,540,000, or $3.64 per volume equivalent for this study. The larger design may net some per-volume savings over the smaller facility because not all construction costs will grow in direct proportion to the facility. In particular, with proper building automation controls that can take advantage of the current state of research in sustainable conservation environments, the larger facility should be able to operate without a significantly larger HVAC plant. These mechanical systems account for about 10% of the costs of the planned facility. This feasibility study increases all major costs except HVAC by 30%, to account for the increased size of the project throughout the other major areas plus an additional 1% for unforeseen added costs, and then adds in the original HVAC costs to arrive at a base cost for the larger facility that is comparable to the SHP study (in 2015 dollars). That cost is escalated by 3% per year to arrive at a cost of $14,540,000 ($3.64 per volume equivalent). These costs are comfortably in line with costs at similar facilities. ReCAP's capital planning process concluded in March 2017, for example, estimated $3.98 per volume for a similar expansion project.

These cost estimates will need to be revisited by qualified architects and engineers before a final capital schedule can be approved. That process should take particular note of the specifications for:

- *Floor leveling and floor load:* Flooring design and construction is a significant expense in these facilities and a critical point of success or failure in the design. A thorough review should be conducted with SpaceSaver, Raymond (or other lift provider) and the engineers to ensure that OSU achieves a sufficient margin of safety in the design without over-building or overspending. This is especially important if there is a decision to build a larger, 4 million item facility, or change the racking plan from the model proposed in the SHP study.
- *Building Automation/HVAC and Air Tightness:* There has been a significant development in the conservation science around environment controls since OSU built its first depository module (see http://www.ipisustainability.org/ for further information). OSU's Preservation staff and the project engineers should meet early in the process to develop an optimal balance between the installed mechanical systems, the building automation systems, and the design of the building envelope. Effective investment across these building elements can achieve high quality and highly reliable preservation outcomes with lower operating costs (for utilities and system maintenance) and sometimes lower capital costs, as well (by limiting the overall complexity, size, and scope of the mechanical plant).
- *Capacity without AV storage (all racked for book trays):* The current study assumed a separate section for audio-visual materials, with some designs using a different racking type and others a partitioned area of the facility. Racking the Specialized AV storage may still be a valid use-case, but projections for capacity with solely book storage should be revisited, and the cost versus capacity tradeoffs of shelving AV materials in standard racking versus specialized racking should be reviewed as well. The Ivy+ storage facilities group (convened by ReCAP's Head of Operations) and the LAMA building and management section are good resources for this.

Operating Costs

Ohio Data

Labor cost estimates are based on the currently reported productivity of the depository staff, and the industry norms for productivity in Harvard-depository style facilities. These operations generally report an overall rate between 50 and 60 actions per hour, depending on the size, activity level, and physical plan of the facility. OSU's actual reports show 51.24 actions per hour, within range and entirely appropriate for a facility on the scale of the OSU depository. (A higher rate is more common in very high volume operations or facilities that are engaged in major intake projects.)

Estimating the amount of activity

The expanded facility will be roughly twice the size of the current operation, and on the simple basis of doubling the size of the staff, OSU would need to field an additional 6.7 FTE to service the expanded depository. The actual size will depend on the rate of intake from partner libraries into the depository and the level of demand for the collection. On a 10-year projection, averaging in a larger staff in the initial years for intake and a smaller staffing cadre for ongoing activity, the additional staff is closer to 8 FTE, but declining to 3 additional FTE once intake is complete (approximately 10 FTE in total).

The partners can negotiate intake rates to a certain extent among themselves, although some participating libraries have a strong need to vacate their current offsite storage within a certain period, which imposes an effective cut-off date on the overall intake process. Usage rates are less susceptible to partner control, since they are determined by the tens of thousands of individual users of the partner libraries.

At present, the OSU depository has an annual circulation rate of approximately 1.3%. This is made up of just over .09% usage from OSU itself, and just under .4% usage from OhioLINK partners. There are several reasons to think usage of a consolidated last copy collection will be somewhat higher, especially as partners draw down local duplicate copies and shift more usage to the central collection. To model this, but still keep the estimate tied to real data sources, the projections used in this planning study assume that:

1. The overall 1.3% usage continues to apply to the entire corpus in the depository,
2. OSU will additionally use the new contributions from partners at a rate similar to their current usage of OSU materials in the depository, and
3. Partner libraries will additionally use the entire corpus at the rate they currently use the OSU depository collections.

This has the net effect of raising the overall circulation rate to 2.4% for planning purposes. For comparison, ReCAP and Harvard Depository show usage just under 2% per year.

For estimating partner library usage, the total estimated volume of transactions may be more informative. In this model, the partners make slightly fewer than 1,000 requests from the first 200,000 items they transfer in. For comparison, UC reports 2,500 requests from 800,000 items in AssureVault, which is 2.5x the request volume from 4x the item count. By the time capacity is exhausted, partners will have transferred just over 2 million items, and will make just over 20,000 requests per year. That is an

average of 4,000 per partner, roughly twice the current volume of OSU to OhioLINK service, and more than 3 times the proportional service volume UC experiences from its current offsite collection.

I believe there is some danger that this usage is overestimated, but for the initial 2-3 years of the project, I advise that there is significant value to avoiding budget shortfalls and using any overage to ensure a stable operating reserve for the operation. Making these estimates based on known usage ratios will also help prime the pump for analytic work as the partnership develops, since OhioLINK usage per library prior to the depository will be one array of values, after the depository another, and likewise total OSU local usage before and after.

Estimating staff size

Ideally, the added staffing needed for increased intake rolls over to manage increased service volume. However, it seems likely that there is pressure to fill the expanded depository fairly quickly, which will require a substantially larger workforce over a short period. To the extent that short term staffing is needed to absorb increased or decreased workloads over the course of the project, OSU's well developed program of student staffing in the depository is an advantage, since it allows depository staffing to cycle on a partial-year basis.

Assuming OSU doubles its current rate of accessions for its own materials (to approximately 130,000 per year) and fills with partner materials at three times this rate (approximately 495,000) per year, the facility will reach capacity in roughly 5 years, with circulation climbing from about 50 items per day in the first year to nearly 300 per day as the facility reaches capacity.

YEAR	**1**	**2**	**3**	**4**	**5**	**6**
Capacity	**2,472,784**	**1,945,568**	**1,418,352**	**891,136**	**363,920**	**-**
OSU Vols	131,804	263,608	395,412	527,216	659,020	1,022,940
OH Vols	395,412	790,824	1,186,236	1,581,648	1,977,060	2,077,060
Intake	527,216	527,216	527,216	527,216	527,216	363,920
Base Circ	6,953	13,905	20,858	27,810	34,763	40,881
OSU Circ	3,765	7,529	11,294	15,058	18,823	19,775
OH Circ	1,933	3,866	5,799	7,733	9,666	11,367
Total Circ	12,650	25,301	37,951	50,601	63,251	72,022

With all these factors in consideration, it should be possible for this work can be accommodated through an expansion of the CCS and student staffing, without adding additional managerial staff, although we do plan for a possible pay and rank increase for the current depository manager to reflect the expanded scope of their responsibilities. This is a key factor in managing the overall costs to the partnership. At present, each depository operation requires labor plus some level of management overhead. A combined depository also consolidates management, for a notable reduction in overhead expenses.

The estimated labor to management ratio of less than 10 FTE to the depository manager is practicable without adding an additional management layer. The larger operation may want to consider advancing one or two of the line staff to a team-lead position that can take responsibility for day-to-day operations

in the absence of the depository manager, but without the managerial responsibilities for hiring, evaluation, and discipline. These positions would add some resiliency to the depository operations, with little additional cost, assuming a 5-10% increase in pay rate over the prevailing salary for line staff.